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10/594,002	05/29/2007	Takashi Saito	450119-05581	4189

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EXAMINER	
ROE, JESSEE RANDALL	
ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,002	SAITO ET AL.	
	Examiner	Art Unit	
	JESSEE ROE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 15* is/are pending in the application.

4a) Of the above claim(s) *1-7, 13 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7 June 2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 1-13 and 15 are pending wherein claims 8-11 are amended, claim 14 is canceled, and claims 1-7, 13 and 15 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (US 2004/0211816) in view of Fujioka et al. (US 3,989,514) and Tahara et al. (US 5,376,188).

In regards to claim 8-10 and 12, Ogawa ('816) discloses a soldering apparatus having a soldering reservoir (solder tank) having a plurality of heaters in the reservoir [0002]. Ogawa ('816) further discloses that the heaters, nozzle and pump (which includes the impeller and the shaft) are made of stainless steel and each would be covered with a chromium oxide layer (passivation layer) and this layer would be protected with a nitride layer ([0003], [0006] and [0013]). The Examiner notes that soldering would require heating to high temperatures.

Ogawa ('816) discloses a soldering apparatus as set forth above, but Ogawa ('816) does not specify that the stainless steel would be austenitic stainless steel or that

the “nitride-reformed layer includes chromium and nitrogen as their solid solutions, but excludes chromium compound".

Fujioka et al. (‘514) teaches using an austenitic stainless steel having not more than 0.15 weight percent carbon, 1.5 to 4 weight percent silicon, not more than 2 weight percent manganese, 17 to 30 weight percent nickel, 24 to 32 weight percent chromium 0.5 to 2.5 weight percent aluminum, 0.001 to 0.100 weight percent calcium, 0.001 to 0.100 weight percent of a rare earth metal, 0 to 1 weight percent of at least one of titanium, zirconium, hafnium, niobium and tantalum, and the balance iron. Fujioka et al. (‘514) further discloses such alloys would have superior resistance and would stand prolonged use under the circumstances where continuous or cyclical heating is endured (abstract and col. 1, lines 6-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the austenitic stainless steel, as disclosed by Fujioka et al. (‘514), as the stainless steel material for the heaters, nozzle, and pump, as disclosed by Ogawa (‘816), in order to have superior resistance and prolonged use under the circumstances where continuous or cyclical heating is endured, as disclosed by Fujioka et al. (‘514) (abstract and col. 1, lines 6-22).

Tahara et al. (‘188) discloses nitriding austenitic stainless steel at a temperature between 380°C and 420°C for a time period of 10 to 20 hours in order to prevent the formation of chromium nitride and thus form a nitrided layer having superior anti-corrosion property (col. 2, lines 25-35 and col. 4, lines 13-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to form the nitride layer on the austenitic stainless steel, as disclosed by Ogawa ('816) in view of Fujioka et al. ('514), by nitriding at a temperature between 380°C and 420°C for a time period of 10 to 20 hours, as disclosed by Tahara et al. ('188), in order to prevent the formation of chromium nitride and thus form a nitrided layer having superior anti-corrosion property, as disclosed by Tahara et al. ('188) (col. 2, lines 25-35 and col. 4, lines 13-42).

Still regarding claim 8, the Examiner notes that a nitride layer with chromium and nitrogen as their solid solutions excluding chromium compound would be expected in the nitrided austenitic stainless steel of Ogawa ('816) in view of Fujioka et al. ('514) and Tahara et al. ('188) because Tahara et al. ('188) discloses nitriding using ammonia gas at the same temperatures for the same amount of time as disclosed in the instant invention Embodiments (col. 4, lines 1-42 of Tahara et al. ('188)).

With respect to the amended feature "having a nitride-reformed layer and a passivation film used on at least a surface of the heater where the heater contacts the solder" in lines 8-9 of claim 8, Ogawa ('816) teaches that the covers of the heaters would be made of stainless steel [0011]; Fujioka et al. ('514) discloses that austenitic stainless steel having not more than 0.15 weight percent carbon, 1.5 to 4 weight percent silicon, not more than 2 weight percent manganese, 17 to 30 weight percent nickel, 24 to 32 weight percent chromium 0.5 to 2.5 weight percent aluminum, 0.001 to 0.100 weight percent calcium, 0.001 to 0.100 weight percent of a rare earth metal, 0 to 1 weight percent of at least one of titanium, zirconium, hafnium, niobium and tantalum, and the balance iron would have superior resistance and would stand prolonged use

under the circumstances where continuous or cyclical heating is endured (abstract and col. 1, lines 6-22); and Tahara et al. ('188) discloses nitriding austenitic stainless steel at a temperature between 380°C and 420°C for a time period of 10 to 20 hours in order to prevent the formation of chromium nitride and thus form a nitrided layer having superior anti-corrosion property (col. 2, lines 25-35 and col. 4, lines 13-42).

With respect to the amended recitation "having a nitride-reformed layer and a passivation film is used on at least a surface of the duct whether the duct contacts the solder" in claim 9, Ogawa ('816) teaches that the duct would be made of stainless steel [0013]; Fujioka et al. ('514) discloses that austenitic stainless steel having the above composition would have superior resistance and would stand prolonged use under the circumstances where continuous or cyclical heating is endured; and Tahara et al. ('188) discloses nitriding austenitic stainless steel to form a nitrided layer having superior anti-corrosion property. Therefore, it would be expected that a duct modified made in view of Ogawa ('816), Fujioka et al. ('514) and Tahara et al. ('188) would be capable of solder contact.

With respect to the amended recitation "austenitic stainless steel having a nitride-reformed layer and a passivation film is used on at least a surface of the jet agitation shaft where the jet agitation shaft contacts the solder and at least a surface of the jet agitation fin where the jet agitation fin contacts the solder" in claim 10, Ogawa ('816) discloses that the members of the wave soldering apparatus would be made of stainless steel and treated with nitrogen ([0012], [0013] and [0015]).

In regards to claim 11, Tahara et al. ('188) discloses that the nitride layer

thickness would be in the range of 10 to 50 μm depth, which overlaps the range of 5 to 15 μm as claimed (col. 4, lines 13-42).

Response to Arguments

Applicant's arguments filed 16 July 2010 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that Group III claims and Group II claims from the Office Action of 23 February 2010 according the amendments of 16 July 2010 now form a subcombination that is essential to the combination according to MPEP 806.05(a)(I) and Applicant's request a reformulation of the restriction requirement and an examination of Group III claims.

In response, the withdrawal of claims 13 and 15 from examination was made final in the Office Action of 26 April 2010.

Second, the Applicant primarily argues that Ogawa ('816), Fujioka et al. ('514) and Tahara et al. ('188) fail to disclose or render predictable the features of claim 8 because Tahara et al. ('188) in column 2, lines 25-30 concedes that "a nitride layer having superior anti-corrosion property can be formed because amorphous chromium nitride is produced therein." and the formation of a chrome compound is in direct contrast with "wherein the nitride reformed layer includes chromium and nitrogen as their solid solutions, but excludes chromium compound," as recited in claim 8.

In response, the Examiner notes that in the instant specification it is taught that austenitic stainless steel would be nitrided in ammonia (NH_3) atmosphere for 20 hours at 420°C [0050] and the temperature range may be as broad as 380 to 430°C and the time may be from 15 to 25 hours [0049]. Tahara et al. ('188) teaches nitriding austenitic stainless steel in an ammonia (NH_3) atmosphere at a temperature in the range of 380 to 420°C for 10 to 20 hours (col. 4, lines 4-42). Therefore, substantially the same structure would be expected in the instant invention as in Tahara et al. ('188) since Tahara et al. ('188) teaches substantially the same process.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Wyszomierski/
Primary Examiner
Art Unit 1793

/JR/
July 27, 2010